2016 Insect Report

Utah Department of Agriculture and Food

PLANT INDUSTRY & CONSERVATION

2016 UDAF Insect Report

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USDA Forest Service Forest Health Protection

National Plant Board

USU Pest Diagnostic Lab

Utah Nursery and Landscape Association

DHS United States Citizenship and Immigration Services

UTAH FRUIT GROWERS

UTAH WEED SUPERVISORS ASSOCIATION

USDA CENTER FOR PLANT HEALTH SCIENCE AND TECHNOLOGY

UDAF Plant Industry thanks all of our partners as well as the following entomologists:

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2016 UTAH DEPARTMENT OF AGRICULTURE AND FOOD INSECT REPORT - V1.1
COVER PHOTO BY DEAN MOREWOOD, USDA FOREST SERVICE

Protecting Utah Agriculture

Utah agricultural industries are valued at over a billion dollars annually, which constitutes about 22% of the state's land in agricultural production. The mission of the Utah Department of Agriculture and Food (UDAF) is to "Promote the healthy growth of Utah agriculture, conserve our natural resources and protect our food supply." Managing insects is essential to this mission. Although most insects are beneficial, pest infestations can be devastating. Hence UDAF Plant Industry and Conservation has been addressing insect issues since pioneer agriculture began here 160 years ago. Some economic estimates of losses to U.S. food crops due to pests approach 40%. Both newly introduced insects and outbreaks of endemic species can cause sudden losses much like a natural disaster. Trends that contribute to these losses include erratic weather patterns and climate change, intensive monoculture farming methods and global commerce, which commonly transports materials of risk great distances. The UDAF Plant Industry and Conservation's Insect Program aims to protect Utah agriculture, food and quality of life from losses due to insects.

Goals and Strategies of the Insect Program

Prevention and Protection

Insects are transported in various ways, often unintentionally. Quarantines and inspections can prevent the establishment of new pests. Surveillance of insects with outbreak potential allows protection of resources at risk.

Early Detection

Using strategic detection, diagnostic networks, and trap and survey technology to detect pests as early as possible minimizes insect damage and the cost of eradication or control. The Insect Program annually surveys and traps over 8,000 locations statewide and works with partners nationwide to share information and employ the latest detection methodology.

Insect Control

There are many effective tools for insect control and more are being developed. UDAF Plant Industry and Conservation uses survey methods, predictive models and economic thresholds to determine the best course of action using a variety of tools to suppress pest populations such as: chemical pesticides, biological controls or cultural methods.

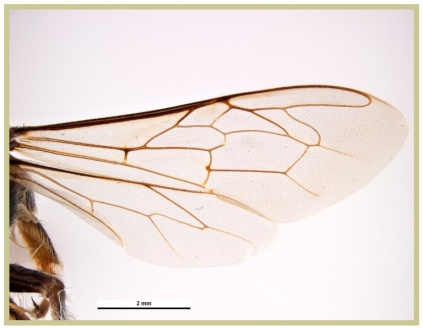
Public Education

Raising awareness of how insect pests are introduced and the consequences of outbreaks can facilitate early detection efforts and protect resources. Teaching Integrated Pest Management (IPM) principles can also help protect beneficial insects and increase environmental stewardship.

Public Education & Detection

Africanized Honey Bee

UDAF Plant Industry & Conservation



PEST AND DISEASES IMAGE LIBRARY, BUGWOOD.ORG

Fig. 1 Africanized honey bee can be identified by measuring wing venation patterns.

Africanized honey bees (AHB) are slightly smaller in size, will live in smaller cavities and will swarm more times per year than European honey bees. They will aggressively defend their hives but may attack unprovoked. AHB may sting thousands of times per attack and will chase victims for a quarter mile or more. Though these bees are dangerous, they have been sensationalized in the media; education efforts have decreased panic and stinging incidents nationwide. It is best practice to keep clear of any encountered honey bee colonies and treat all colonies with the respect they deserve.

Africanized honey bees (AHB) were first detected in Utah near St. George in 2008. Shortly thereafter, they were found in Kane and Iron counties as far north as Parowan. In 2010, AHB was found in San Juan County in the small town of Bluff. In 2015 genetic testing determined that AHB was present in Wayne & Grand Counties. Preliminary testing in 2016 hinted at possible AHB activity in Emery County, however additional data is needed before AHB can be listed as established in Emery County. As of January 2017 the counties with known established AHB populations are: Washington, Iron, Kane, San Juan, Wayne, & Grand. UDAF Plant Industry and Conservation has been working with beekeepers, setting traps and monitoring feral colonies for AHB since the 2008 detection. UDAF will continue to monitor and trap for AHB in the future in an effort to inform the public of the presence of AHB in their communities. The Apiary program strives to educate the public and commercial beekeepers about AHB, and to address their concerns.

Pollinator Protection

Apiary Program

UDAF Plant Industry & Conservation
USDA APHIS PPQ

Utah, the “Beehive State”, produces more than a million pounds of honey each year. Honey bees are key pollinators of many crops grown throughout the state—from large-scale orchards and farms to backyard fruit trees and gardens. Utah’s bees are also important to agriculture nationwide, as most of the state’s commercial beekeepers move their hives to other states to provide pollination services.

STEPHEN STANKO, UDAF

Fig. 2 Inspectors were able to survey hives in winter with an infrared camera.

Managing the numerous diseases, parasites, and other maladies that affect Utah’s colonies is a high priority for UDAF Plant Industry and Conservation. The Apiary Program has been working to protect managed colonies by conducting health inspections, disease testing, and education on pest and disease management. The combined efforts of state and county bee inspectors resulted in thousands of hives surveyed in 2016. The most commonly detected problem was excessive Varroa mite infestation. Chalkbrood was far more prevalent than in year’s past and was a persistent problem for many beekeepers. Only one case of American foulbrood, the most devastating bee disease, was found. The infection was found in Washington County and was treated appropriately.

In 2016 the Apiary Program conducted extensive winter inspections using an infrared camera provided by the University of Utah Biology Department. This first of its kind inspection program allowed state apiary specialists to survey bee yards for dead-outs quickly and accurately. Dead-out hives identified were given a post mortem examination. This inspection program prevented the spread of disease by encouraging beekeepers to properly clean up their dead-out colonies before they could be robbed in the spring.

Fruit Industry

Apple Maggot & Cherry Fruit Fly

Utah Fruit Growers
UDAF Plant Industry & Conservation

The apple maggot (*Rhagoletis pomonella*), also known as the "railroad-worm," and the cherry fruit fly (*R. indifferens),* are both picture-wing flies native to North America. Both insects have become major pests of fruit trees in the U.S. and Canada. The UDAF Plant Industry and Conservation program began in 1985 with the discovery of apple maggot in abandoned and non-commercial cherry orchards in Utah County. In 2016, 16 sites were monitored during the growing season and cherry fruit flies were found in Box Elder, Davis and Utah counties.

There are approximately 615 commercial fruit growers in Utah, with a commercial value of an estimated $17 million annually. All fruit marketed for export must be free from any apple maggot and cherry fruit fly injury, so thorough and effective control measures are necessary. This program allows Utah fruit growers to export fruit outside of Utah.

In addition to trapping, this program provides commercial growers with information to improve insecticide spray timing. Accurately timed sprays result in the following: better control, smaller amounts of pesticides being used, less environmental impact, and lower production costs.

JOSEPH BURGER, BUGWOOD.ORG

Fig. 3 The apple maggot is a native pest that originally fed on wild hawthorn.

WHITNEY CRANSHAW, COLORADO STATE UNIVERSITY

Fig. 4 The yellow sticky trap pictured is an effective means of monitoring this pest.

Natural Resource Protection

Asian Defoliators

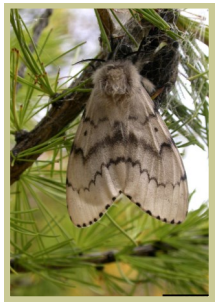
UDAF Plant Industry & Conservation
USDA APHIS—PPQ

Asian defoliators (e.g., *Dendrolimus pini, D. sibiricus, Lymantria monacha, L. dispar asiatica*) pose a significant potential threat to Utah's forests and related industry. Due to an increase of shipments of containerized cargo and the movement of plant material into Utah, monitoring for the presence of Asian defoliators and other exotic forest pests is crucial to protect our natural resources. Exotic defoliators have a large host range that includes all species of conifer and hardwood trees found throughout the state. If introduced, the forests and climate of Utah provide ideal settings for these species to become established. Asian defoliators can be introduced through commerce because females can deposit eggs in crevices on containers, pallets and ships.

JOHN GHENT, BUGWOOD.ORG

Fig. 5 The Asian gypsy moth (larvae pictured) was recently detected in the Northwest U.S.

Using pheromones specific to these pests, UDAF Plant Industry and Conservation places traps in high-risk areas of the state. Trapping areas include shipping corridors along railroads and highways, landing points (including airports and military bases), areas where large quantities of plant debris are collected, and any high risk areas recommended by U.S. Customs and Immigration Service and USDA APHIS-PPQ. In 2016, 800 traps were deployed to detect adults of these species with negative results for all species.



JOHN GHENT, BUGWOOD

Fig. 6 Female Asian gypsy moth adult.

MANFRED MIELKE, USFS

Fig. 7 Adults aggregating on a tree.

Fruit Industry

Brown Marmorated Stink Bug

USU Department of Biology,
UDAF Plant Industry & Conservation

SUSAN ELLIS, BUGWOOD.ORG

Fig. 8 In 2016, brown marmorated stink bug was found in commercial orchards.

The first U.S. detection of the brown marmorated stink bug (BMSB), *Halyomorpha halys*, which is native to Asia, occurred in the 1990's in Allentown, PA. Since its introduction, it has spread quickly and is now reported in 43 states, causing severe damage in some states. Unlike many agricultural pests, BMSB is a year-round problem. It can cause severe damage as it feeds on fruits and vegetables, resulting in necrotic tissue and cat-facing injury. In the fall, BMSB migrates indoors where it aggregates, becoming a nuisance pest and emitting a foul odor when disturbed or destroyed.

USU conducted several outreach events and workshops in Cache, Box Elder, Davis, Salt Lake and Utah counties, and focused on educating growers and homeowners about BMSB biology, monitoring, identification and best management practices.

In addition, surveys for BMSB took place in 2016 in northern Utah. 61 BMSB traps were monitored in multiple counties from April through October. Trapping locations included commercial orchards, urban settings, and community gardens (multiple vegetable crops). BMSB adults were found in five counties surveyed; the highest number of catches were in Salt Lake County. For the first time in Utah this survey detected BMSB in commercial orchards. This is significant because BMSB often starts as a mere nuisance pest shortly after introduction, but later becomes an agricultural pest. In 2017, Utah State University and Utah Department of Agriculture and Food will continue to survey for this pest throughout Utah.

Urban Habitat Protection

Emerald Ash Borer

USDA APHIS PPQ
UDAF Plant Industry & Conservation

DAVID CAPPAERT, BUGWOOD.ORG

Fig. 9 The emerald ash borer poses a threat to Utah's ornamental and native ash.

Emerald ash borer (EAB; *Agrilus planipennis*) is native to Asia, and was likely introduced through wood packing material used to ship cargo from Asia to Michigan; it was first detected in 2002. EAB continues to spread rapidly to states and provinces in and around the Great Lakes region in Canada and the USA. EAB quickly killed many millions of ash trees (*Fraxinus* sp.) in these areas, and can now be easily spread from infested areas by transporting infested trees and logs (especially firewood). In its native ecosystem, this insect exists in balance with competitors, natural predators, and pathogens. It does not cause economic damage in this setting. However, in North America, without these balancing factors, EAB has caused rapid tree mortality affecting all ash species it attacks. Symptoms of infestation begin with crown dieback, which is followed by epicormic shoots, splitting bark, increased woodpecker damage, serpentine galleries, and D-shaped exit holes. These symptoms progress until the tree is dead.

In addition to Utah's many ornamental ash trees in urban landscapes, there are two native ash species that are part of the state's forest ecosystem. All of these species would be vulnerable to EAB attack, causing economic and aesthetic losses in urban areas and ecological impacts in natural settings. In 2016, APHIS PPQ placed 69 baited traps throughout 10 counties, targeting high-risk ash trees. UDAF Plant Industry and Conservation also placed traps in trees that members of the public reported had symptoms associated with EAB infestation. No EAB were detected from either federal or state efforts.

Crop Protection Export Program

European Corn Borer

UDAF Plant Industry & Conservation

ADAM SISSON, IOWA STATE UNIVERSITY; BUGWOOD

Fig. 10 The larval form of the European corn borer has a pinkish tan body.

ADAM SISSON, IOWA STATE UNIVERSITY; BUGWOOD

Fig. 11 Adult females have a light colored wings, whereas males are darker.

MARIUSZ SOBIESKI, BUGWOOD.ORG

Fig. 12 Damage to the plant includes vascular tissue and ear shank.

This highly adaptable pest attacks over 200 plant species. During its early history in the United States, the European corn borer (*Ostrinia nubilalis*) spawned one generation yearly. By the late 1930s, a two-generation per annum European corn borer mushroomed swiftly and became a dominant pest in the central Corn Belt. It continued spreading in all directions, with the southernmost populations spawning three and four generations per year.

UDAF Plant Industry and Conservation administers a quarantine for small grains and other agricultural crops that may contain the European corn borer to prevent this destructive insect from entering Utah. When shell corn is brought into the state from the Midwest every year, the shipments are certified that they meet Utah's European Corn Borer Quarantine.

UDAF Plant Industry and Conservation also coordinates a European corn borer trapping program. In 2016, this effort consisted of 41 traps placed in chief corn producing areas statewide. No new records of the European corn borer were found in Utah from these extensive detection efforts.

Invasive Species Early Detection

European Grapevine Moth

UDAF Plant Industry & Conservation

JACK KELLY CLARK, UC DAVIS IPM

Fig. 13 Immature stages are tan or brown; later stages are darker.

JACK KELLY CLARK, UC DAVIS IPM

Fig. 14 The adult moth has a mosaic pattern on the wings.

First found in California vineyards in 2009, European Grapevine Moth (EGVM; *Lobesia botrana*) is native to southern Italy and causes significant economic damage. As its name suggests it is a pest of grapes (*Vitis vinifera*), however it also feeds on blackberry (*Rubus fruticosus*), gooseberry (*Ribes sp*.), cherry (*Prunus avium*), prunes (*Prunus domestica*), carnations (*Dianthus spp*.) and many other plants.

The first generation larvae feed on the flower buds and flower clusters. Subsequent generations feed on the fruit, leaving only seeds and skin. Webbing and frass are found on host plants. Feeding damage often leads to Botyrtis infections as well as other secondary diseases. Obvious signs of infestation include grapes that turn brown or rot, webbing on inflorescences and the presence of larvae on host plants.

UDAF Plant Industry and Conservation is committed to preventing the entrance and establishment of this pest. In 2016 traps were set at 16 sites in three counties; no EGVM were detected.

Invasive Species Early Detection

Gypsy Moth

UDAF Plant Industry & Conservation
USDA APHIS—PPQ

TIM TIGNER, VIRGINIA DEPARTMENT OF FORESTRY

Fig. 15 The devastating defoliation of this forest was caused by the European gypsy moth.

Gypsy moth (GM; *Lymantria dispar*) is established in the eastern U.S. Because their egg masses are laid on virtually any substrate, they are often moved long distances to new territory.

Utah's arid climate and mountainous terrain have a high potential for GM introduction and establishment; this is capable of causing widespread negative impacts on Utah's landscapes. Utah is not part of the contiguous range of GM populations in the Eastern U.S. Therefore GM early detection and, if necessary, eradication are cost effective strategies to prevent establishment of this forest and urban pest in Utah.

GM was first found in Utah in 1988. Since then, UDAF Plant Industry and Conservation has been the lead agency in the administration of a major survey and control program. When populations are found, they can be treated and effectively eradicated before damage occurs. UDAF Plant Industry and Conservation has successfully eradicated introduced GM populations twice using the bacterium *Bacillus thuringiensis* var. *kurstaki (Btk)* and annually monitors for new introductions.

The 2016, Utah Gypsy Moth Program placed 1,823 detection traps in areas of highest risk of introduction and establishment. These trapping efforts resulted in the detection of one gypsy moth in Davis County. In 2017 the program will place a delimiting grid of traps around the detection site to determine if other moths are present in the area and if so, what the extent of the infestation is.

Early Detection & Eradication

Japanese Beetle

UDAF Plant Industry & Conservation
USDA APHIS—PPQ

DAVID CAPPAERT, BUGWOOD.ORG

Fig. 16 Japanese beetle larvae (pictured) are devastating turf grass pests.

The Japanese beetle (JB; *Popillia japonica*) is a highly ruinous pest which causes plant damage and increases control costs. It has swept through most of the eastern United States. Adults attack more than 300 species of plants, including numerous trees, ornamental shrubs, vines, fruits, flowers, vegetables, garden crops, weeds, and field crops. Larvae are serious pests of lawns, other grasses and nursery stock. Because the larvae are easily shipped with nursery stock and soil, JB is a serious threat to Utah's $167 million nursery economy and has been part of UDAF Plant Industry and Conservation's detection trapping program since 1993.

When a JB infestation was discovered in Orem, Utah in 2006, the infestation was delimited using pheromone baited traps, and an eradication plan was devised. Treatment began in 2007 with turf and foliar applications. Delimiting data allowed the treatment area to shrink over consecutive years and no treatments were conducted in recent years. With multiple years of negative catches in the Orem area, UDAF declared eradication of the Utah County JB population in fall of 2014.

Yet the ongoing threat of JB continues, in 2014 two male beetles were found in Salt Lake County at separate locations and in 2015 one male and one female beetle was found in the Avenues area of Salt Lake City. A total of 2,014 traps were placed statewide in 2016; no beetles were detected. Even so, statewide trapping will continue as well as high density delimiting trapping in the areas of recent detection during 2017 to ensure this pest does not establish in Utah.

Cropland & Rangeland Habitat Protection

Mormon Cricket & Grasshopper

UDAF Plant Industry & Conservation
USDA APHIS—PPQ

For the past decade, disaster declarations by the governor have focused resources (administered through UDAF Plant Industry and Conservation) to provide relief from major infestations of Mormon crickets (*Anbrus simplex*) and grasshoppers (various genera). Mormon cricket and grasshopper infestations are historically significant because they are difficult to predict and cause widespread damage to crop and rangeland habitats.

DAVID CAPPAERT, BUGWOOD.ORG

Fig. 17 *Melanoplus sanguinipes* (pictured) was commonly found in 2016.

The overall goal of the UDAF Plant Industry and Conservation's grasshopper and Mormon cricket program is to facilitate biologically sensitive and effective suppression programs before widespread damage occurs. In 2016 a total of 146,553 acres were infested with grasshoppers; cost share programs were approved in six counties for 11 participants. The cost share program is an ongoing effort to support farmers and ranchers ability to suppress rangeland pests from damaging crops. Elements that have contributed to successful control of rangeland pest are: available funding, collaboration with all affected stakeholders, and accurate survey data.

In 2016, the most common species of grasshoppers surveyed were *Melanoplus confuses, Camnula pellucida, Aulocara elliotti, Melanoplus packardii* and *Melanoplus sanguinipes*. No Mormon crickets were detected by survey efforts in 2016.

Fruit Industry Export Program

Plum Curculio

Utah State University
Utah Fruit Growers
UDAF Plant Industry & Conservation

CLEMSON UNIVERSITY, BUGWOOD.ORG

Fig. 18 After feeding, larvae leave fruitets to burrow into soil where they pupate.

PEST AND DISEASE IMAGE LIBRARY, BUGWOOD.ORG

Fig. 19 Adults emerge later in the season and feed on almost-ripe fruit.

Utah's fruit industry is valued at approximately $17 million annually, with over 615 operations growing at least 6,700 acres of cherries, peaches, and apples. Plum curculio (*Conotrachelus nenuphar*) is a pest of stone and pome fruits and is native to eastern North America. In 1999, it was detected in backyard fruit trees in Brigham City.

The presence of plum curculio in Brigham City is sustained by unmanaged fruit trees located in residential areas. Unmanaged fruit trees serve as a reservoir for populations of this insect. Each year Utah State University and UDAF Plant Industry and Conservation, in conjunction with Brigham City, provide information to educate home owners about this insect and how to manage or remove the fruit trees.

Utah's fruit orchard survey consists of 16 sentinel sites in Box Elder, Davis and Utah counties. Three specimens were found in Box Elder County, where this pest is known to be established. However no plum curculio were found in Davis or Utah counties.

Public Health & Nuisance

Imported Fire Ants

USDA APHIS—PPQ

USU Department of Biology

USDA APHIS PPQ, Bugwood.org

Fig. 20 Imported fire ants feed on various crops, but also pose a health threat to humans and animals.

Imported fire ants are both a public health risk and an economic threat. They were first introduced to the southern U.S. in the 1930s from South America. They are federally quarantined pests not known to occur in Utah, but can be easily introduced in infested soil.

Imported Fire ants can feed on many agricultural crops, including corn, soybean, and fruit trees. The aboveground mounds make cultivation, irrigation, and harvesting almost impossible. Imported fire ants can infest urban areas and become a nuisance that deters outside activity. Not only are imported fire ant mounds unattractive, the ants are aggressive and sting humans and other animals. UDAF Plant Industry and Conservation uses quarantine enforcements, port of entry inspections, and public education to keep Utah free of imported fire ants. Annual surveys to detect introductions of red imported fire ant (RIFA; *Solenopsis invicta)* and the black imported fire ant (BIFA; *S. richteri*) focus on Washington County, the most suitable climate and habitat in Utah.

Utah State University sampled 22 sites in 2016. During this survey, neither RIFA nor BIFA was detected at any of the sites. However native *Solenopsis* species, *S. xyloni*, has been detected at several sites, its presence may indicate that RIFA/BIFA have not yet established in Washington County, Utah.

Fruit Industry

Spotted Wing Drosophila

USU Biology Department

ERIC R. DAY, VIRGINIA POLYTECHNIC

Fig. 21 Close up photo of the spotted wing drosophila

ERIC R. DAY, VIRGINIA POLYTECHNIC

Fig. 22 The insect feeds on various fruits, like raspberry

The spotted wing drosophila (SWD; *Drosophila suzukii*) has the potential to devastate the eight different tree fruits and six different berries grown by at least 370 operations in Utah. The pest was first discovered in Davis County berry field in 2010. This fly is closely related to other vinegar flies in the genus *Drosophila*, however unlike other flies SWD can attack unripe fruit. Soft-skinned fruits are likely to be especially susceptible to SWD. Damage includes abscesses, secondary fungal growth and superficial scarring of the fruit.

Several outreach events and workshops were conducted by USU in Cache, Box Elder, Davis, Salt Lake and Utah counties, and focused on educating growers and homeowners about SWD biology, monitoring, identification and best management practices.

In addition to these outreach efforts, Utah State University conducted a survey for SWD which included 150 traps in Box Elder, Cache, Davis, Rich, Utah and Weber counties. Over 10,000 SWD were found in 2016; most flies were found in wild habitats.

All SWD samples were screened by Lori Spears and her lab technicians at Utah State University. In 2017, Utah State University will continue surveys for this pest in high fruit production and commercial orchards areas.

Early Detection & Rapid Response

Velvet Longhorn Beetle

UDAF Plant Industry & Conservation
USDA APHIS—PPQ—CPHST

CLINT BURFITT, UDAF

Fig. 23 A tree infested with velvet longhorn beetle.

The velvet longhorn beetle (VLB; *Trichoferus campestris*) was first discovered in North American in the province of Quebec, Canada in 2002. It was first detected in Utah at a trapping site in South Salt Lake City in July 2010.

The VLB attacks healthy or slightly stressed trees of many important species. It prefers to attack mature trees, which results in tree death or causes significant loss of vigor. This damage may result in a devaluation of host trees in urban settings, a loss of wood marketability (because of the boreholes) and/or reduced fruit yields in the case of orchards. Nevertheless, the relative importance of VLB in damaging forest trees, trees in natural environments, orchard trees, and amenity trees has not been evaluated beyond the observation that the preferred hosts are fruit or amenity trees (*Malus* and *Morus*).

Continued survey for the VLB was conducted in Utah in 2016. 85 cross vane panel traps were placed at two sites in Salt Lake and Utah County, which targeted the known epicenters of VLB in Utah at a golf course and an orchard. In addition 30 traps were placed in six counties to monitor the spread of this pest. Over 4,000 VLB specimens were detected from these efforts. A single VLB was detected in Tooele County for a new county record; this brings the total number of Utah counties infested to four. State and federal agricultural officials plan to continue surveying in 2017, to help further the understanding of the biology and risk of this invasive pest.

Invasive Species Habitat Restoration

Weed Biological Control

UDAF Plant Industry & Conservation
Utah Weed Supervisor Ass.
USDA APHIS—PPQ

BECCA MACDONALD, SAULT COLLEGE, BUGWOOD.ORG

Fig. 24 Utah has 3 classes of noxious weeds. Oxeye daisy is a "Class A" weed and is of very high priority for control.

OHIO STATE WEED LAB, OSU

Fig. 25 Houndstongue is a "Class C" noxious weed.

Noxious weeds are spreading at an alarming rate across the western United States, including Utah. Although the exact acreage is unknown, 100% of Utah's counties are severely infested by at least one of the state-designated 27 noxious weeds. The negative impacts of weeds are well known and profound. Noxious weeds can create monocultures that eliminate diverse plant communities. Watersheds dominated by noxious weeds tend to be less efficient in absorbing and storing water resulting in increased soil erosion. Noxious weeds can diminish forage production for all classes of herbivores and reduce habitat for small birds and animals. In addition, many noxious weeds are poisonous or injurious to animals.

The biological control of noxious weeds remains a cost effective and environmentally friendly method of preserving range habitat from invasive species. In 2016 the Utah Weed Supervisor Association conducted outreach education about bio-control agents in conjunction with collecting and distributing biological control agents to help restore critical habitat.

Early Detection & Rapid Response

Wood Borer Survey

UDAF Plant Industry & Conservation
USDA APHIS– PPQ

GERALD J. LENHARD, LOUISIANA STATE UNIVERSITY

Fig. 26 The smaller European elm bark beetle (*Scolytus multistriatus*) is an introduced species present in Utah.

Bark beetle damage is a conspicuous reality in the forests of the western United States. Several exotic species of wood borers have been detected throughout North America in the past decade. Some invasive species of wood borers have caused devastating tree mortality and subsequent loss of critical habitat. Exotic wood borers are being transported by the global movement of soft and hardwood packing material. These materials are used by foreign exporters to transport commodities, such as glass, machinery, stone, tile, and plumbing fixtures. International efforts have succeeded in creating policy that requires the treatment of these materials, however, introductions of exotic wood borers continues to occur.

Invasive species survey is a critical component of the early detection and rapid response (EDRR) model used nationally. In 2016, the UDAF Plant Industry received funding to place traps that are designed to attract a variety of wood boring beetles. 60 Lindgren funnel traps were placed at 20 different sites along the Wasatch front. The traps were baited with the following combination of lures: Ips complex lure, ethanol and a-pinene lures, and a-pinene lure. Thousands of individual specimens were identified to species, with no new exotic species detected.

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Utah Agriculture Web Resources

2016 Plant Industry Insect Report
http://ag.utah.gov/documents/Insect_2016_InsectReport.pdf

Utah Plant Pest Diagnostics Lab
http://utahpests.usu.edu/uppdl/

Utah Cooperative Agricultural Pest Survey
http://utahpests.usu.edu/caps/

Utah Horticultural Association
http://www.utahhort.org/

Honey Bee Resources
http://ag.utah.gov/plants-pests/beekeeping.html

Utah Weed Supervisors Association
http://www.utahweed.org/

Utah Nursery and Landscape Association
http://www.utahgreen.org/

UDAF Insect and Quarantine Program
http://ag.utah.gov/plants-pests/insects.html

Grazing Improvement Program
http://www.ag.utah.gov/animals.html?id=273:grazing-improvement&catid=64

Summary of Invasive and Native Pest Risks

Asian Defoliators	Significant potential threat to Utah's forests and related industries
Emerald Ash Borer	Threaten to kill all ornamental and native ash trees in Utah
European Corn Borer	Potential to devastate Utah's $25 million corn harvest
Honey Bee Pests and Diseases	Potential to disrupt Utah's $2 million honey industry
Gypsy Moth	Potential to destroy Utah's watersheds, forests and residential landscapes
Japanese Beetle	Potential to damage Utah's $128 million floriculture industry and $17 million fruit industry
Mormon Cricket and Grasshoppers	Potential to significantly reduce Utah's $715 million small grain and field crop industry
Orchard Pests	Potential to devastate Utah's $34 million fruit industry
Red Imported Fire Ant	Economic damage caused in the U.S. exceeds $5 billion and a public health risk